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WE CLAIM

1. In an optical network, a method for providing differentiated services for a plurality of WDM layer applications, comprising:

5 providing communication over said optical network for transmitting user traffic along a communication path; and

controlling execution of each said WDM layer applications supporting said communication path according to a class of service (CoS).

10 2. A method as claimed in claim 1, wherein said step of controlling comprises: connecting all network elements along said communication path over a supervisory network;

transmitting control data over said supervisory network for supporting said CoS to each respective network element; and

15 executing a WDM layer application at said network element to operate said network element according to said CoS.

3. A method as claimed in claim 2, wherein said control data provide one or more operating parameters of said WDM layer application.

20 4. A method as claimed in claim 3, wherein said operating parameter is the internal priority level associated with said WDM layer application.

25 5. A method as claimed in claim 3, wherein said operating parameter is the latency level for said WDM layer application.

6. A method as claimed in claim 3, wherein said operating parameter is the acceptable loss level for said WDM layer application.

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7. A method as claimed in claim 3, wherein said operating parameter is the bandwidth for said WDM layer application.

8. A method as claimed in claim 1, wherein said WDM layer application is one or more application selected from the network internal applications including: laser safety shutdown, distributed internode control loops, out-of-band signalling channel, alarms, warnings, provision/configuration request, performance monitoring control, orderwire, and remote software download.

9. A method as claimed in claim 2, wherein said supervisory network is carried over plurality of supervisory channels (OSC).

10. A method as claimed in claim 9, wherein said step of providing communication between all network elements comprises providing said network element with OSC termination equipment.

11. A method as claimed in claim 2, wherein said control data comprises protocol data units (PDU) transported over said supervisory network.

12. A method as claimed in claim 11, wherein said step of transmitting control data comprises:

at a first network element,

- a) generating an add supervisory PDU comprising QoS information destined to said WDM layer application operating at a second network element;
- b) providing said add supervisory PDU with an identification tag; and
- c) transmitting said add supervisory PDU over said supervisory network.

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13. A method as claimed in claim 12, wherein step of (c) comprises:

- forwarding said add supervisory PDU to an appropriate output port queue;
 - queuing said add supervisory PDU according to said QoS information; and
 - routing a plurality of said add supervisory PDU from different queues over said
- 5 supervisory network according to said CoS.

14. A method as claimed in claim 11, wherein said step of transmitting control data comprises:

at a first network element,

- 10 a) receiving a drop supervisory PDU comprising QoS information;
- b) determining from an identification tag that said drop supervisory PDU is destined to said first network element;
- c) extracting said QoS information from said drop supervisory PDU; and
- d) executing said WDM layer application according to said QoS information.

15. A method as claimed in claim 11, wherein said step of transmitting control data comprises:

at a first network element,

- a) receiving a continue supervisory PDU comprising QoS information;
- 20 b) determining from an identification tag that said supervisory PDU is destined to a second network element of said communication path; and
- c) transmitting said supervisory PDU over said supervisory network.

16. A method as claimed in claim 15, wherein step (c) comprises:

- 25 - extracting said QoS information from said continue supervisory PDU;
- forwarding said continue supervisory PDU to an appropriate output port queue;
- queuing said continue supervisory PDU according to said QoS information; and
- transmitting a plurality of said continue supervisory PDU from different queues according to said CoS.

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17. A method for providing differentiated services for internal applications of a DWDM transmission network, comprising:

providing communication between a source node and a destination node over a plurality of intermediate nodes for transmitting user traffic along a communication path; at said source node,

transmitting QoS information over a supervisory network connecting said source and destination nodes over said plurality of intermediate nodes; and

controlling operation of all said intermediate nodes and said destination node according to said QoS information.

18. A method for providing differentiated services for internal applications of a DWDM transmission network, comprising:

providing communication between a source node and a destination node over a plurality of intermediate of intermediate nodes for transmitting user traffic;

connecting said source node and said destination node over a supervisory network, including said plurality of intermediate nodes; and

controlling operation of all said intermediate nodes and said destination node according to a preset CoS.

19. A method as claimed in claim 18, wherein said supervisory network operates over one or more optical supervisory channels provided between any two adjacent nodes of said network.

20. A method as claimed in claim 18, wherein said supervisory network is an ATM network and said source, destination, and intermediate nodes comprise an ATM switch.

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21. A method as claimed in claim 18, wherein said transmission network is an IP/TCP network and said source, destination, and intermediate nodes comprise IP routers.

5 22. A method as claimed in claim 18, wherein said transmission network is an IP network and said source, destination, and intermediate nodes comprise a DiffServ enabled IP router.

10 23. A method as claimed in claim 18, further comprising classifying said internal applications according to one of the extremely low, low, medium, high latency level.

24. A method as claimed in claim 18, further comprising classifying said internal applications according to one of the extremely low, low, medium, high loss level.

15 25. A method as claimed in claim 18, further comprising classifying said internal applications according to one of the low, medium, high bandwidth level.

20 26. A method as claimed in claim 18, further comprising classifying said internal applications according to one of the low, medium, high priority level.

27. A method as claimed in claim 18, wherein said preset CoS provides operating parameters for a plurality of inter-node control loops.

25 28. A method as claimed in claim 18, wherein said preset CoS includes a plurality of QoS instructions.

29. A method as claimed in claim 28, wherein said QoS instructions include latency and loss.

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30. A method as claimed in claim 29, herein said QoS instructions further include application priority.

5 31. A method as claimed in claim 18, further comprising transmitting information over said supervisory network.

32. A method as claimed in claim 30, wherein said information is a signalling traffic.

10 33. A method as claimed in claim 30, wherein said information is a user traffic.

34. An optical transport network, comprising:

- a transport plane;
- a control plane including supervisory channels connecting adjacent nodes;
- 15 - a packet network on top of said control plane for switching/routing control plane traffic according to a preset class of service (CoS)

35. The network of claim 34, further comprising a central network management entity connected to said control plane.

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